REMARKS/ARGUMENTS

Responsive to the Office Action, Applicants submit herewith an Information Disclosure Statement in compliance with the Requirements For Information.

In response to the requirement to provide a list of citations to electronically searchable databases or other indexed collections containing publications that document the knowledge within the disclosed art, Applicants state that such databases or indexed collections are unknown to Applicants.

In response to the requirement to provide the citation and a copy of each publication which any of the Applicants authored or coauthored and which disclose the subject matter of measuring and reducing the cost of complexity, Applicants are submitting such citations and copies of those publications which are known to Applicants with the Information Disclosure Statement filed concurrently herewith.

In response to the requirement to provide the citation and copy of each publication that is a source used for the description of the prior art in the disclosure, such publications are listed on the Information Disclosure Statement filed concurrently herewith and including copies of such publications. The publication by Michael L. George entitled "Lean Six Sigma", for example, refers to the Lean process, Six Sigma, Lean Sixth Sigma, Toyota Production System and Kanban System, for example.

In response to the requirements to provide the citation and copy of each publication that any of the Applicants relied upon to develop the disclosed subject matter that describes the invention or that was relied upon to draft the claimed subject matter, Applicants submit the following explanations with regard to the publications listed on the Information Disclosure Statement.

With regard to the Nahmias reference (Production and Operations Analysis) and the Chase et al. reference (Production and Operations Management), these publications represent a single product, single workstation situation. The derivations in the instant application extend this line of analysis to multiple products and multiple workstations. The multiple product aspect is one important aspect of the invention. Moreover, Applicants' invention differs from optimal batch size models which assign a cost to performing a setup and a cost to hold an inventory. The invention is not a cost minimization model but rather a derivation that illustrates how the complexity of a product line (or a service process) affects the minimum total inventory (work in process and finished goods) that must be maintained to meet individual and aggregate demand.

The Anupindi et al. reference (Managing Business Process Flows) discloses a second element of prior work which was relied on in developing the present invention. This reference contains an explanation of Little's law.

Aside from the general form of the inventory buildup diagrams disclosed in the above-described references and Little's Law, Applicants did not use any prior published work in deriving the present invention, other than Applicants' own prior patents which do not address product or service complexity. However, the prior patents do make available the general form of the workstation turnover time equation.

Further in compliance with the requirement to provide the citation and copy of publications which document the knowledge within the disclosed art of measuring and reducing the cost of complexity in producing products or services, Applicants submit herewith the Roundy references. However, neither of these references contain the derivations and equations similar to the present invention.

With respect to publications which any of the Applicants authored or coauthored and cited in the enclosed Information Disclosure Statement, Chapter 5 of the publication entitled *Lean Six Sigma For Service* discusses the general principles of the present invention. However, this publication is not prior art with respect to the invention disclosed and claimed in the subject application.

Still further, in compliance with the requirement to submit copies of any publication in which any of the Applicants authored or coauthored which describe the disclosed subject matter in the instant application, the publication entitled "Conquering Complexity In Your Business" is also submitted

pursuant to this requirement. However, this publication is also not prior art with respect to the invention disclosed and claimed in the above-identified application.

With respect to the Applicants/Assignees publication entitled "Lean Six Sigma", this reference fails to disclose or suggest Applicants' invention with respect to developing, measuring and reducing the cost of complexity in products or services.

In response to the requirement to provide the names of any products or services that have incorporated the disclosed prior art of measuring and reducing the cost of complexity, Applicants are unaware of any such products or services.

In response to the requirement to state whether any search of the prior art was performed, Applicants state that a prior art search was not performed except with respect to an electronic search of the Jackson Library Collection at Stanford University, Palo Alto, California, in an attempt to locate prior published works that bear on the derivations of equations in the instant application. The Roundy references are those which are considered, in any way, to contain subject matter remotely similar to the present invention.

With regard to the specific improvements of the claimed subject matter in Claims 1 through 12 and new Claim 13 over the disclosed prior art, Applicants respectfully submit that the prior art fails to disclose or suggest a method for determining the relative cost reduction achieved by reduction of complexity

of a product, a series of products or a service by comparing process activity parameters, such as setup time, product quality improvement, processing time per product unit, product scrap rate, product rework rate, rework processing time and average setup time to perform rework, as compared with a number of different product part numbers processed, including the steps of determining aggregate demand according to Claim 2, determining minimum batch size according to the equation of Claim 3, comparing the nonvalue added cost of process time per product unit with the number of part numbers being processed according to Claim 4, determining the common workstation turnover time for all workstations according to the equation of Claim 5, comparing the nonvalue added cost of defective product units with the number of product part numbers being produced according to Claim 6, or comparing the nonvalue added cost of demand in product units per unit of time with the number of product part numbers being processed according to Claim 7, or determining the average total system inventory in a facility according to the equation of Claim 8, or determining the average total system inventory in a facility in accordance with the equations of Claims 9 and 10. Still further, the specific improvements provided by the claimed subject matter in the claims presently in this application over the disclosed prior art include determining workstation turnover time and adjusting selected process activity parameters, including the total number of different parts or products, according to the equations of Claim 11 or Claim 12.

Pursuant to the Examiner's objection to listing references cited in the specification, Applicants believe they have complied with the requirement of incorporation by reference by listing U.S. Patent Nos. 5,195,041 and 5,351,195. These references were cited in the specification as being incorporated by reference and copies of the patents were submitted with the filing of this application.

With respect to the discussion of the Toyota Production System, Kanban, Lean, Lean Six Sigma, Shingo, and Kaplan, these methodologies are merely disclosed or discussed in the specification for purposes of comparison with the improvement provided by the instant invention and are not considered relevant prior art, since Applicants have not uncovered any prior art which addresses the issue of reducing complexity in products and services, particularly with respect to the specific methodologies disclosed and claimed in the instant application. Applicants verily believe they have made a diligent effort to comply with the requirements of 37 C.F.R. 1.98(b) by submitting the enclosed Information Disclosure Statement. U.S. Patent Nos. 5,195,141 and 5,351,195 are of record pursuant to the Examiner's listing of these references on PTO Form 892.

Applicants request reconsideration for allowance of Claims 1 through 12, and consideration for allowance of new Claim 13, for the reasons set forth herein. Claims 1 through 12 have been amended to overcome the rejections under 35 U.S.C. 112, 35 U.S.C. 101 and 35 U.S.C. 103. With respect to the rejection

under 35 U.S.C. 112, Applicants have made a diligent effort to amend the claims to include proper definitions of the variables and the simplifying assumptions applicable to the equations.

With respect to the rejection under 35 U.S.C. 101, Applicants have also amended the claims to clearly recite physical steps in independent Claims 1, 11 and 12 and in new Claim 13 by reciting, for example, the step of changing at least one of the process activity parameters to reduce the work in process in accordance with the inventive methodology. Such steps cannot be carried out in the mind of the user or by use of a pencil and paper. Accordingly, the claims now presented are believed to conform to the requirements of 35 U.S.C. 101.

Applicants verily believe that the claims presented in this amendment distinguish patentably over the prior art including the teaching of U.S. Patent 5,195,041 to George et al. in view of the reference entitled "Robust Designs Through Design to Six Sigma Manufacturability" by Hoehn et al. (herein the Hoehn et al reference). The George et al. reference discloses and claims methods of scheduling and operating production in a factory having plural workstations including the steps of determining the rate of material flow of each process within each workstation, determining the size of the batch of material for each process necessary to meet each material flow rate and operating each process at each workstation with the batch sizes determined. George et al. does not address the issue of complexity, such as the number of different product part numbers

or the number of different product units being processed. As pointed out by the Examiner, the Hoehn et al. reference does not expressly teach methods or metrics used as part of the robust design methodology nor does Hoehn et al. suggest modifying one of process setup time, process time per product unit and the number of different product numbers processed and then changing at least one of these process activity parameters to reduce the work in process at a given time as required by Claim 1.

With regard to dependent Claim 2, neither of the references suggest the steps of determining the aggregate demand in product units per hour multiplied by the customer demand rate for respective product units per hour and reducing work in process by selective reduction of at least one of product part numbers, process setup time and processing time per product unit.

With regard to dependent Claim 3, the references of record in this application clearly fail to disclose or suggest the step of determining minimum batch size from the equation set forth in this claim. With respect to dependent Claim 4, the references fail to suggest the additional step of comparing nonvalue added cost of process time per product unit with the number of product part numbers being processed.

With regard to Claim 5, there is no suggestion in George et al. or Hoehn et al., taken alone or one modified in view of the other, of the process step of determining common workstation turnover time for all workstations processing N product part

numbers from the equation given in Claim 5 wherein all product units have the same demand, setup time and process time per product unit as required by this claim.

Still further, with regard to Claim 6, the references fail to disclose or suggest the additional step of comparing nonvalue added cost of defective product units with the number of product part numbers being produced. The references clearly fail to disclose or suggest the step of comparing the nonvalue added cost of demand in product units per unit of time with the number of product part numbers being processed as required by Claim 7.

With regard to Claims 8, 9 and 10, George et al. as modified by Hoehn et al. clearly fails to disclose or suggest the steps of determining the average total system inventory in a facility for synchronized average work in process, for setup on batch arrival work in process or from fully asynchronized average work in process utilizing the equations of dependent Claims 8, 9 and 10.

Claims 11 and 12 have also been amended to more clearly distinguish these claims over the prior art and to conform to the requirements of 35 U.S.C. 112 and 101 pursuant to the Office Action. Neither George et al. nor Hoehn et al. disclose or suggest the relationship of setup time, time required to process one unit of a part or product at a workstation with the number of different parts or products being processed to determine workstation turnover time, or changing selected ones of these

process activity parameters to reduce workstation turnover time as required by Claim 11, as now presented.

With respect to Claim 12, as now presented, neither George et al. nor Hoehn et al. disclose or suggest the method for reducing work in process at a given time by the steps set forth in this claim. Accordingly, reconsideration for allowance of Claims 1 through 12, as amended herein, is respectfully requested.

With regard to the rejection of Claims 8 through 10 under 35 U.S.C. 103(a) as being unpatentable over the teaching of George et al. in view of Hoehn et al. and further in view of Bolch et al., Queuing Networks and Markov Chains, Applicants respectfully submit that none of these references disclose or suggest the equations set forth in Claims 8 through 10. In particular, Claims 8 through 10 set forth equations which are deterministic rather than stochastic and do not display any of the Markov properties suggested by Bolch et al. Clearly, these equations are not set forth in Bolch et al. Accordingly, the overall combination of steps set forth in Claims 8 through 10 as now presented are not believed to be made obvious by the teaching of George et al., Hoehn et al. or Bolch et al. taken alone or one modified in view of the other.

Applicants present with this amendment new Claim 13 which is believed to be necessary to fairly protect the invention disclosed in this application. Consideration for allowance of Claim 13 is also respectfully requested.

Applicants have made a diligent effort to advance the prosecution of this application by complying with the requirements of the Office Action with respect to the Requirement For Information, by amending the claims to conform to the requirements of 35 U.S.C. 112 and 101 and by pointing out with particularity herein how the claims distinguish patentably over the teaching of the prior art. An early Notice of Allowance of Claims 1 through 13 is respectfully solicited.

Respectfully submitted,

Date: *May 18, 2005*

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